

CLAIMS:

1. A magnetic-field-sensitive sensor arrangement comprising
- a first conductor arrangement with at least two electrical half-bridges each
having at least two bridge branches, at least one of which contains a magnetic-field-sensitive
semiconductor element, which sensor arrangement supplies a measurement signal depending
5 on the magnetic field strength of a component of a magnetic field at the location of at least
one of the half-bridges, this being referred to as the measurement field and being aligned in a
measurement direction of the sensor arrangement, and
- a device which forms the measurement field with a value of its magnetic
field strength, which depends on the magnetic permeability of a medium that at least partially
10 surrounds the sensor arrangement, whereby the measurement signal is a measure of the
magnetic permeability of the medium.

2. A magnetic-field-sensitive sensor arrangement as claimed in claim 1,
characterized in that the at least one magnetic-field-sensitive element is designed as a
15 magnetoresistive element.

3. A magnetic-field-sensitive sensor arrangement as claimed in claim 2,
characterized in that the device which forms the magnetic field is designed with a stabilizing
magnet.
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4. A magnetic-field-sensitive sensor arrangement as claimed in claim 3,
characterized in that the stabilizing magnetic has a recess on one of its surfaces, via or in
which recess the first conductor arrangement is arranged.

25 5. A magnetic-field-sensitive sensor arrangement as claimed in claim 4,
characterized in that the stabilizing magnet is magnetized such that the field lines of the
magnetic field formed by it emerge essentially vertically from a bottom surface of the recess.

6. A magnetic-field-sensitive sensor arrangement as claimed in claim 2, characterized by at least a second conductor arrangement for generating at least a first additional magnetic field component in the measurement direction of the sensor arrangement.

5 7. A magnetic-field-sensitive sensor arrangement as claimed in claim 6, characterized in that the at least a first additional magnetic field component is provided to superpose and/or compensate a magnetic field externally impressed on the sensor arrangement in the measurement direction.

10 8. A magnetic-field-sensitive sensor arrangement as claimed in claim 2, characterized by at least a third conductor arrangement for generating at least a second additional magnetic field component in a direction which is at least largely at right angles to the measurement direction of the sensor arrangement.

15 9. A magnetic-field-sensitive sensor arrangement as claimed in claim 8, characterized in that the at least a second additional magnetic field component is provided to set the operating point of the sensor arrangement.

20 10. A magnetic-field-sensitive sensor arrangement as claimed in any of the preceding claims, characterized by an evaluation circuit to which the measurement signal of the sensor arrangement is fed, and also a temperature measurement device which is coupled to the evaluation circuit and in which a temperature signal is generated that is a measure of the current temperature of the sensor arrangement and/or of the medium surrounding the latter, wherein the temperature signal is likewise fed to the evaluation circuit in order to
25 compensate a temperature-induced change in the measurement signal of the sensor arrangement.

30 11. A magnetic-field-sensitive sensor arrangement as claimed in claim 10, characterized in that the compensation of the temperature-induced change in the measurement signal of the sensor arrangement in the evaluation circuit also comprises the compensation of a temperature-dependence of the device which forms the measurement field.

12. A magnetic-field-sensitive sensor arrangement as claimed in claim 10, characterized in that the compensation of temperature-induced changes in the measurement

signal of the sensor arrangement in the evaluation circuit is effected by converting the values of the measurement signal according to a predefined function of the temperature.

13. A magnetic-field-sensitive sensor arrangement as claimed in claim 10,
5 characterized by at least a fourth conductor arrangement which is coupled to the evaluation circuit and is fed by the latter according to a predefined function of the temperature, for impressing at least a third additional magnetic field component for compensating temperature-induced changes in the measurement signal of the sensor arrangement.

10 14. A magnetic-field-sensitive sensor arrangement as claimed in claim 10, characterized by at least a fifth conductor arrangement which comprises at least one electrical half-bridge with at least two bridge branches that are insensitive to magnetic fields, which fifth conductor arrangement is connected to the first conductor arrangement or parts thereof in a predefined operating state of the sensor arrangement to form a bridge circuit.

15 15. A magnetic-field-sensitive sensor arrangement as claimed in claim 14, characterized in that the fifth conductor arrangement is combined with at least the first conductor arrangement to form a common module.

20 16. A magnetic-field-sensitive sensor arrangement as claimed in claim 14, characterized in that the fifth conductor arrangement is combined with at least the evaluation circuit to form a common module.

25 17. A magnetic-field-sensitive sensor arrangement as claimed in any of the preceding claims, characterized in that the medium surrounding the sensor arrangement surrounds the first conductor arrangement only in the region of part of its half-bridges, and in that the rest of the sensor arrangement is surrounded by a material which suppresses the effect of the magnetic permeability of the medium on at least one of the half-bridges of the first conductor arrangement.

30 18. A magnetic-field-sensitive sensor arrangement as claimed in any of the preceding claims, characterized by a design for a medium with variable oxygen content.